

Name _____

Calculus

Review

This review sheet should NOT serve as your only review. You should review all notes and tests.

Questions 1 through 7 refer to the graph of $y = f(x)$ shown to the right.

1. $\lim_{x \rightarrow 1^-} f(x) =$

2. $\lim_{x \rightarrow 1^+} f(x) =$

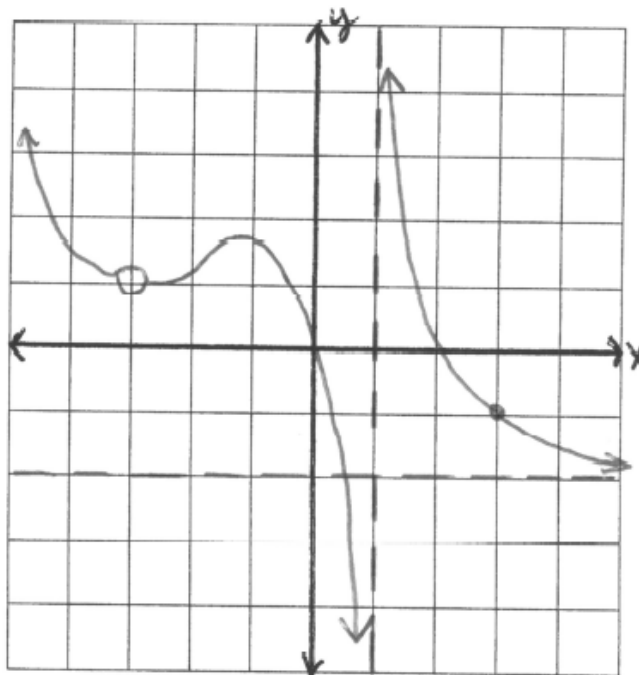
3. $\lim_{x \rightarrow 1} f(x) =$

4. $\lim_{x \rightarrow -3} f(x) =$

5. $\lim_{x \rightarrow 3} f(x) =$

6. $\lim_{x \rightarrow -\infty} f(x) =$

7. $\lim_{x \rightarrow \infty} f(x) =$



For each of the following functions, use the definition of derivative to find $f'(x)$.

Recall: $f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$

8. $f(x) = 2x^2 - 8x + 5$

9. $f(x) = \sqrt{x+2}$

Find the derivative of each of the following:

10. $f(x) = 8x + 2\sqrt[3]{x} - \frac{3}{x^3}$

11. $f(x) = \sin(5x^3 + 2x)$

12. $f(x) = \sqrt[3]{(5x^2 + 2x)^2}$

13. Find the slope of the line tangent to $y = x(\cos(x))$ when $x = 0$.

14. Write the equation of the line tangent to $y = 3x^2 - 2x + 1$ when $x = -1$.

15. The following table records the values of f , f' , g , and g' at $x = 1$, $x = 2$, and $x = 3$.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	2	1	2	3
2	5	4	3	4
3	0	6	-1	-2

If $n(x) = \frac{f(x)}{g(x)}$, $h(x) = f(g(x))$, find the value of each of the following: a) $n'(2)$ b) $h'(1)$

16. If $f(x) = \sqrt[3]{(x^2 - 2x - 1)^2}$, then $f'(0) = ?$

17. Is $h(x)$ continuous for all real numbers? If so show why.

$$h(x) = \begin{cases} x+3, & x \leq -2 \\ -x^2, & x > -2 \end{cases}$$

18. Evaluate $\lim_{x \rightarrow 2} \frac{x^2 + 3x - 10}{x - 2}$.

19. Evaluate $\lim_{x \rightarrow \infty} \frac{2x^3 - 3}{3x^3 + 25}$.

20. Find the derivative of each of the following:

a) $f(x) = e^{2x} \sin(3x)$

b) $y = \frac{\ln(2x)}{\sqrt{x^2 + 5x}}$